

Serial No. 10/614,895

Attorney Docket No. 01-442

**LISTING OF CLAIMS:**

1. (Currently amended) A control device in a hybrid compressor that is within a refrigerating circuit and driven by one of an engine and an electric motor, wherein the hybrid compressor includes a compression mechanism that is driven by rotation of a swash plate, and an inclination angle of the swash plate is varied by a capacity controller that is externally controlled, the control device comprising a controller for

(i) operating the hybrid compressor, after the engine stops, in a low capacity state, in which a displacement of the hybrid compressor is decreased to a second displacement from a first displacement that is generated by the engine before the engine is stopped,

(ii) then operating the hybrid compressor by setting the capacity controller to a first control value to trigger the swash plate to be rapidly inclined when the hybrid compressor starts being driven by the electric motor and formotor, and

(iii) then operating the hybrid compressor by setting the capacity controller to a second control value after the controller has operated the hybrid compressor based on the first control value, wherein the first control value increases the displacement more ~~is~~ greater than the second control value does, and the second control value is obtained from a status of the refrigerating circuit.

2. (Currently amended) A control device in a hybrid compressor that is within a refrigerating circuit and driven by one of an engine and an electric motor, wherein the hybrid compressor includes a compression mechanism that is driven by rotation of a swash plate, wherein an inclination angle of the swash plate is varied by a capacity controller that is externally controlled, and wherein the control device comprises a controller for

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(i) operating the hybrid compressor, after the engine stops, in a low capacity state, in which a displacement of the hybrid compressor is decreased to a second displacement from a first displacement that is generated by the engine before the engine is stopped,

(ii) then operating the hybrid compressor by driving the electric motor at a first number of revolutions to thereby trigger the swash plate to be rapidly inclined when the hybrid compressor starts being driven by the electric motor and for motor, and

(iii) then operating the hybrid compressor by driving the electric motor at a second number of revolutions after the controller has operated the hybrid compressor based on the first number of revolutions and the displacement is increased from the second displacement in the low capacity state, wherein the first number of revolutions is greater than the second number of revolutions.

3. (Previously presented) The control device according to Claim 1, further comprising:  
a pressure detector for detecting refrigerant pressure in a higher portion of the refrigerating circuit,

wherein the first control value varies according to the refrigerant pressure detected by the pressure detector.

4. (Previously presented) The control device according to Claim 2, further comprising a pressure detector for detecting refrigerant pressure in a higher pressure portion of the refrigerating circuit, wherein the first number of revolutions varies according to the refrigerant pressure detected by the pressure detector.

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5. (Previously presented) The control device according to claim 1, wherein the controller operates the hybrid compressor based on the first control value for a certain period after the hybrid compressor starts being driven by the electric motor.

6. (Previously presented) The control device according to Claim 1, further comprising a revolution number detector for detecting a number of revolutions of the electric motor, wherein the controller operates the hybrid compressor until the revolution number detector detects a certain decrease in the number of revolutions of the electric motor, after the hybrid compressor starts being driven by the electric motor.

7. (Previously presented) The control device according to Claim 1, further comprising an electric current detector for detecting an electric current of the electric motor, wherein the controller operates the hybrid compressor until the electric current detector detects a given decrease in the electric current of the electric motor, after the hybrid compressor starts being driven by the electric motor.

8. (Currently amended) The control device according to ~~Claim 1 or 2~~Claim 1, further comprising an air temperature detector for detecting a temperature of air that has passed through an evaporator of the refrigerating circuit, wherein the controller operates the hybrid compressor until the air temperature detector detects a decrease in the temperature of air that has passed through the evaporator.

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9. (Previously presented) The control device according to Claim 1, wherein the controller operates the hybrid compressor for a given period after the hybrid compressor is controlled based on the first control value and before the hybrid compressor is operated based on the second control value by setting the capacity controller at a variable control value that converges, for the given period, from the first control value to the second control value.

10. (Previously presented) The control device according to Claim 2, wherein the controller operates the hybrid compressor for a given period after the hybrid compressor is controlled based on the first number of revolutions and before the hybrid compressor is operated based on the second number of revolutions, by driving the electric motor at a variable number of revolutions that converges, for the given period, from the first number of revolutions to the second number of revolutions.

11. (Currently amended) A hybrid compressor that is within a refrigerating circuit and driven by one of an engine and an electric motor, comprising:

a swash plate rotated by one of the engine and the electric motor;

a compression mechanism driven by rotation of the swash plate;

a capacity controller that is externally controlled and varies an inclination angle of the swash plate; and

a controller for

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(i) operating the hybrid compressor, after the engine stops, in a low capacity state, in which a displacement of the hybrid compressor is decreased to a second displacement from a first displacement that is generated by the engine before the engine is stopped,

(ii) then operating the compression mechanism by setting the capacity controller to a first control value to trigger the swash plate to be rapidly inclined when the compression mechanism starts being driven by the electric motor and for motor, and

(iii) then operating the compression mechanism by setting the capacity controller to a second control value after the controller has operated the compression mechanism based on the first control value, wherein the first control value is greater increases the displacement more than the second control value does, and the second control value is obtained from a status of the refrigerating circuit.

12. (Currently amended) A hybrid compressor that is within a refrigerating circuit and driven by one of an engine and an electric motor, comprising:

a swash plate rotated by one of the engine and the electric motor;  
a compression mechanism driven by rotation of the swash plate;  
a capacity controller that is externally controlled and varies an inclination angle of the swash plate; and  
a controller for

(i) operating the hybrid compressor, after the engine stops, in a low capacity state, in which a displacement of the hybrid compressor is decreased to a second displacement from a first displacement that is generated by the engine before the engine is stopped,

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(ii) then operating the compression mechanism by driving the electric motor at a first number of revolutions to trigger the swash plate to be rapidly inclined when the compression mechanism starts being driven by the electric motor, and ~~for~~

(iii) then operating the compression mechanism by driving the electric motor at a second number of revolutions after the controller has operated the compression mechanism based on the first number of revolutions and the displacement is increased from the second displacement in the low capacity state, wherein the first number of revolutions is greater than the second number of revolutions.

13. (Currently amended) A control device in a hybrid compressor that is within a refrigerating circuit and driven by one of an engine and an electric motor, the hybrid compressor includes a compression mechanism that is driven by rotation of a swash plate, and an inclination angle of the swash plate is varied by a capacity control valve that is externally controlled, wherein the control device comprises a controller that

(i) operates the hybrid compressor, after the engine stops, in a low capacity state, in which a displacement of the hybrid compressor is decreased to a second displacement from a first displacement that is generated by the engine before the engine is stopped,

(ii) then operates the hybrid compressor at a first control value to trigger the swash plate to be rapidly inclined when the hybrid compressor starts being driven by the electric motor and ~~for~~

(iii) then operates~~operating~~ the hybrid compressor at a second control value after the controller has operated the hybrid compressor based on the first control value and the displacement is increased from the second displacement in the low capacity state,

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wherein the first control value ~~is greater~~ increases the displacement more than the second control value does, and wherein the second control value is obtained from a status of the refrigerating circuit.

14. (Original) The control device according to Claim 13,

wherein the control device includes the capacity control valve, and

wherein the first control value includes a first electric current applied to the capacity control valve while the second control value includes a second electric current applied to the capacity control valve.

15. (Previously presented) The control device according to Claim 13,

wherein the control device includes the electric motor, and

wherein the first control value includes a first number of revolutions of the electric motor while the second control value includes a second number of revolutions of the electric motor.

16. (Previously presented) The control device according to claim 2, wherein the controller operates the hybrid compressor based on the first number of revolutions for a certain period after the hybrid compressor starts being driven by the electric motor.

17. (Currently amended) A control apparatus for a hybrid compressor that is within a refrigerating circuit, wherein the hybrid compressor is driven by one of an engine and an electric

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motor, and a compression mechanism of the hybrid compressor is driven by rotation of a swash plate, and an inclination angle of the swash plate is varied by an externally controlled capacity controller, and wherein the control apparatus comprises ~~a controller~~ control means for

(i) operating the hybrid compressor, after the engine stops, in a low capacity state in which a displacement of the hybrid compressor is decreased to a low capacity displacement, which is smaller than the displacement that exists before the engine is stopped, and

(ii) then operating the hybrid compressor by setting the capacity controller to an initial control value, which is ~~greater~~ increases the displacement more than a given control value based on a state of the refrigerating circuit, for triggering the swash plate to rapidly incline when the electric motor starts driving the hybrid compressor, and before the capacity controller is set to the given control value, the capacity controller is set to the initial control value.

18. (Currently amended). A control apparatus for a hybrid compressor that is within a refrigerating circuit, wherein the hybrid compressor is driven by one of an engine and an electric motor, a compression mechanism of the hybrid compressor is driven by rotation of a swash plate, and an inclination angle of the swash plate is varied by an externally controlled capacity controller, and wherein the control apparatus comprises ~~a controller~~ control means for

(i) operating the hybrid compressor, after the engine stops, in a low capacity state, in which a displacement of the hybrid compressor is decreased to a low capacity displacement, which is smaller than the displacement that exists before the engine is stopped, and



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(ii) then operating the hybrid compressor by driving the electric motor at an initial number of revolutions, which is greater than a preset number of revolutions, for causing the swash plate to rapidly incline when the electric motor starts driving the hybrid compressor, and before the motor is driven using the preset number of revolutions, the motor is driven at the initial number of revolutions.

19. (New) The control device according to Claim 2, further comprising an air temperature detector for detecting a temperature of air that has passed through an evaporator of the refrigerating circuit, wherein the controller operates the hybrid compressor until the air temperature detector detects a decrease in the temperature of air that has passed through the evaporator.

20. (New) The control device according to Claim 1, wherein  
the controller operates the hybrid compressor in the low capacity state after the engine stops by setting the capacity controller to a minimum control value, which decreases a displacement to the second displacement, which is a minimum displacement of the hybrid compressor, and

application of electric current to the electric motor is started when the hybrid compressor is in the low capacity state before the hybrid compressor starts being driven by the electric motor.

21. (New) The control device according to Claim 2, wherein

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the controller operates the hybrid compressor in the low capacity state after the engine stops by setting the capacity controller to a minimum control value, which decreases a displacement to the second displacement, which is a minimum displacement of the hybrid compressor, and

application of electric current to the electric motor is started when the hybrid compressor is in the low capacity state before the hybrid compressor starts being driven by the electric motor.

22. (New) The hybrid compressor according to Claim 11, wherein

the controller operates the compression mechanism in the low capacity state after the engine stops by setting the capacity controller to a minimum control value, which decreases a displacement to the second displacement, which is a minimum displacement of the hybrid compressor, and

application of electric current to the electric motor is started when the compression mechanism is in the low capacity state before the compression mechanism starts being driven by the electric motor.

23. (New) The hybrid compressor according to Claim 12, wherein

the controller operates the compression mechanism in the low capacity state after the engine stops by setting the capacity controller to a minimum control value, which decreases a displacement to the second displacement, which is a minimum displacement of the compression mechanism, and

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application of electric current to the electric motor is started when the compression mechanism is in the low capacity state before the compression mechanism starts being driven by the electric motor.

24. (New) The control device compressor according to Claim 13, wherein

the controller operates the hybrid compressor in the low capacity state after the engine stops by setting the capacity controller to a minimum control value, which decreases a displacement to the second displacement, which is a minimum displacement of the hybrid compressor, and

application of electric current to the electric motor is started when the hybrid compressor is in the low capacity state before the hybrid compressor starts being driven by the electric motor.

25. (New) The control apparatus according to Claim 17, wherein

the controller operates the hybrid compressor in the low capacity state after the engine stops by setting the capacity controller to a minimum control value, which decreases a displacement to the second displacement, which is a minimum displacement of the hybrid compressor, and

application of electric current to the electric motor is started when the hybrid compressor is in the low capacity state before the hybrid compressor starts being driven by the electric motor.

26. (New) The control apparatus according to Claim 18, wherein

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the controller operates the hybrid compressor in the low capacity state after the engine stops by setting the capacity controller to a minimum control value, which decreases a displacement to the second displacement, which is a minimum displacement of the hybrid compressor, and

application of electric current to the electric motor is started when the hybrid compressor is in the low capacity state before the hybrid compressor starts being driven by the electric motor.